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(57) [Abridgement]

[Structure]

Polyvinyl acetal composition which contains 0.01 to ethylidenebis alkylphenol system compound 3 weight part to polyvinyl acetal 100 weight part.

[Effect]

Polyvinyl acetal composition is excellent in heat-resistant stability, without spoiling the desirable characteristics of polyvinyl acetal.

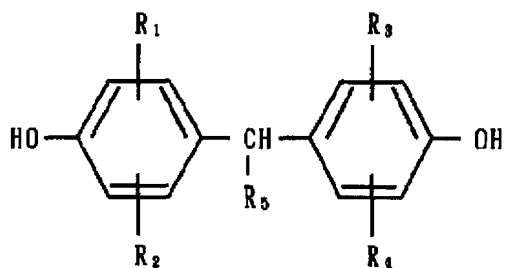
[Claim]

[Claim 1]

Polyvinyl acetal composition characterized by carrying out 0.01-3 weight-part inclusion of the compound represented with following general formula (I) to this polyvinyl acetal 100 weight part in the composition containing the compound represented with polyvinyl acetal and following general formula (I).

[Chemical formula] 1]

一般式 ( I )



(R<sub>1</sub> in an upper type - R<sub>5</sub> show the hydrocarbon group of the carbon numbers 1-4, respectively)

[Detailed Description of the Invention]

[0001]

[Industrial Application]

this invention relates to the polyvinyl acetal composition which was excellent in heat-resistant stability.

[0002]

[The conventional technique]

Conventionally, polyvinyl acetal acetal-izes polyvinyl alcohol (it may be hereafter called PVA) by aldehyde, is manufactured, and is industrially used widely in applications, such as a coating material, adhesives, and a safety glass interlayer.

[0003]

However, there is a problem that heat-resistant stability of polyvinyl acetal is insufficient, for example, the solution viscosity falls by thermal deterioration, or the grain, a solution, mold goods, etc. color.

[0004]

Various procedures are proposed for amelioration of these problems.

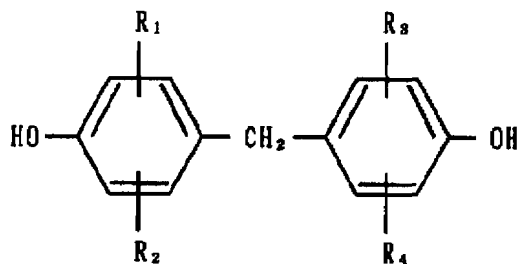
[0005]

For example, the procedure of blending with polyvinyl acetal the compound shown with a following general formula (A) is indicated by the No. Japan Unexamined Patent Publication Showa 54-125291 official report.

[0006]

[Chemical formula] 2]

一般式 (A)



(R<sub>1</sub> in an upper type - R<sub>4</sub> show the hydrocarbon group which has a carbon number of 1-4 pieces, respectively.)

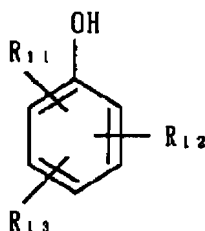
[0007]

Moreover, the procedure of blending with polyvinyl acetal the compound shown with the following general formula (B) or (C) is indicated by the No. Japan Unexamined Patent Publication Showa 54-125292 official report.

[0008]

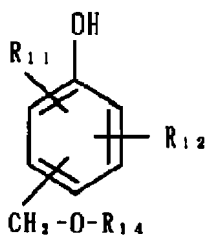
[Chemical formula] 3]

一般式 ( B )



[Chemical formula] 4]

一般式 ( C )

CH<sub>2</sub>-O-R<sub>14</sub>

[R<sub>11</sub>, R<sub>12</sub>, and R<sub>13</sub> show the hydrocarbon group of hydrogen or the carbon numbers 1-4 among the above-mentioned general formula (B) and (C), and R<sub>14</sub> shows a methyl group or an ethyl group, respectively. ]

[0009]

However, when durability is insufficient because of the sublimability of the compound to add etc. or the compound itself to add forms quinone structure, the heat-resistant amelioration effect by these procedures generates a color on the contrary, and cannot be said to be a satisfying enough thing.

[0010]

[Problem(s) to be Solved by the Invention]

this invention is made in view of the above-mentioned conventional technology, and there is a place made into the object in offering the polyvinyl acetal composition which was excellent in heat-resistant stability.

[0011]

[The means for solving a subject]

As a result of analyses, various the inventors of this inventions acquire knowledge that the heat-resistant stability excellent in the polyvinyl acetal composition which made polyvinyl acetal contain a specific compound is shown, and come to complete this invention.

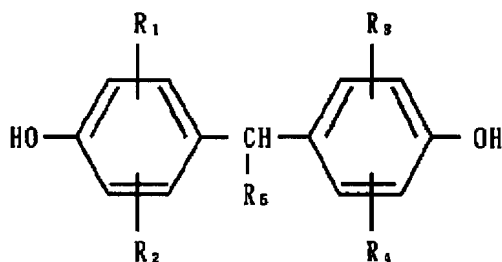
[0012]

Namely, in the composition containing the compound by which this invention is represented with polyvinyl acetal and following general formula (I) It is the polyvinyl acetal composition characterized by carrying out 0.01-3 weight-part inclusion of the compound represented with following general formula (I) to this polyvinyl acetal 100 weight part.

[0013]

[Chemical formula] 5]

一般式 (I)



(R<sub>1</sub> in an upper type - R<sub>5</sub> show the hydrocarbon group of the carbon numbers 1-4, respectively)

[0014]

Hereafter, this invention is explained in detail.

[0015]

Below compound [ represented with the above-mentioned general formula (I) which the composition of this invention is made to contain As an example of calling it compound (I)], 4,4'-butylidenebis- (6-t-butyl-3-methyl phenol), Although 2,2'-ethylidenebis- (4,6-di-t-butyl phenol), 2,2'-iso- butylidenebis- (4,6-di-methyl phenol), etc. are mentioned, 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) is especially desirable.

[0016]

The rate that the polyvinyl acetal composition of this invention contains compound (I) is 0.02 to 2 weight part preferably 0.01 to 3 weight part to polyvinyl acetal 100 weight part. When less than 0.01 weight parts are not enough as improvement in the heat-resistant stability of polyvinyl acetal composition as for the rate and it exceeds three weight parts, heat becomes easy to color polyvinyl acetal composition.

[0017]

There is no restraint in particular in the polyvinyl acetal used in order to obtain the composition of this invention, and arbitrary things can be used.

[0018]

Polyvinyl acetal can be obtained, for example in configurations, such as a powder grain and liquid, by using PVA as a feedstock and acetal-izing it by aldehyde. In the polyvinyl acetal used by this invention, the usual PVA obtained by saponifying a carboxylic acid vinyl ester polymer besides the acetal-ized polyvinyl acetal The polyvinyl acetal obtained by using as a feedstock PVA, combining different PVA(s), such as denaturation polyvinyl acetal obtained using PVA

which denaturalized by copolymerization, post-denaturation, etc. as a feedstock PVA and denaturation, un-denaturalizing, an average degree of polymerization, and the degree of saponification, two or more sorts is included. As for Feedstock PVA, it is common to use a with an average degree of polymerization of about 200 to 4000 which saponified completely selectively the polymer of fatty acid vinyl ester, such as vinyl acetate, and the copolymer thing.

[0019]

Although the procedure of of (1), (2), and (3) which shows PVA below for acetal-izing is common, it is not limited to these.

- (1) Sedimentation :P Aldehyde is added under existence of an acid catalyst in VA aqueous solution, and an acetal-ized reaction is started. Then, it is the procedure of precipitate generating with progress of acetal-izing and progressing a reaction by a heterogeneous system henceforth.
- (2) Solution process :P The solvent of polyvinyl acetal is made to suspend VA powder, aldehyde is added under existence of an acid catalyst, and an acetal-ized reaction is started. It is the procedure of dissolving a reactant in a solvent and progressing a reaction by a homogeneous system after that with progress of acetal-izing.
- (3) Homogeneous system method :P How to progress a reaction by a homogeneous system from beginning to end while adding the bottom of existence of an acid catalyst, and aldehyde in VA aqueous solution, starting an acetal-ized reaction, adding the solvent of the polyvinyl acetal which has compatibility in water before precipitate formation and preventing crystallization formation of precipitate.

[0020]

As aldehyde used in the acetal-ized reaction, PVA For example, formaldehyde, acetaldehyde, propionaldehyde, There are butyraldehyde, crotonaldehyde, benzaldehyde, etc., and the aldehyde can use one sort or can also use the polyvinyl acetal obtained by making the reaction system of acetal-izing live together, and using two or more sorts in this invention. Although it is common that an alkaline substance neutralizes an acid catalyst on the occasion of termination of an acetal-ized reaction, you may make it react with alkylene oxide.

[0021]

The procedure which a restraint in particular does not have in the procedure of obtaining the composition of this invention, and adds compound (I), for example to an acetal-ized reaction system, The procedure of adding at processes, such as crystallization, filtration, and desiccation, the procedure of adding these processes to the powder granular polyvinyl acetal pass, There is a procedure which the solution or compound of polyvinyl acetal used in order to obtain the procedure and moldings which are added in the procedure of adding to the solution or emulsion of polyvinyl acetal, the coating material containing polyvinyl acetal, adhesives, etc. is made to contain, or a procedure which combined these. Especially, since the procedure of adding compound (I) to an acetal-ized reaction system and the procedure of being after termination of an acetal reaction and adding at the process before desiccation already demonstrate an effect in the stoving process at the time of obtaining polyvinyl acetal by the shape of dry particles, they are desirable.

[0022]

When it faces adding compound (I) to polyvinyl acetal and there is a loss of this compound (I) by the manufacturing process of polyvinyl acetal etc. The amount of addition of this compound is adjusted so that the content of this compound (I) may serve as 0.01 to 3 weight part to polyvinyl acetal 100 weight part in the composition obtained.

[0023]

Although you may add to polyvinyl acetal as it is, a blowout or where emulsification dispersion is carried out, mixing, spraying, immersion, etc. can perform compound (I) to aldehyde, a PVA aqueous solution, the medium for an acetal-ized reaction, an organic solvent, a plasticizer, etc. by the additive arbitrary procedures of blending.

[0024]

As matter which can make the composition of this invention blend and contain various matter, and is made to blend and contain for example, it is uncured -- or a partial cure thermosetting resin (phenol system resin and amino system resin --) bulking agents (clay --) of an inorganic system or an organic system, such as melamine system resin and these modified resins A talc, calcium carbonate, powdered silica, carbon black, carbon fiber, Plasticizers, such as powder of plastics without glass fiber, silica flour, zeolite, polyvinyl acetal, and compatibility, pigments (carbon, titanium oxide, a basic zinc chromate system compound, etc.), stabilizers, catalysts, colors, inorganic salt, and surface active agents are mentioned. Although what is usually used as a plastic plasticizer can be used as a plasticizer To polyvinyl butyral system composition, the plasticizing ester [triethylene glycol di-2-ethyl butyrate, triethylene glycol di-2-ethyl hexoate, di( butoxyethoxyethyl adipate), etc. which has an ether linkage in intramolecular is desirable. [0025] The rate which blends various matter and the composition of this invention is made to contain can be arbitrarily chosen according to the object.

[0026]

[Execution example]

Hereafter, an execution example and a comparison example explain this invention concretely. In addition, as for the following, as long as there is no notice, a "weight part" and a "weight%" are shown a "part" and "%", respectively.

[0027]

Execution example 1

The heat blowout of 100 copies of PVA(s) of average-degree-of-polymerization 1700 and saponification degree 98.5 mol% was carried out in the reaction container which offered thermoregulation and a churning apparatus at the water of 900 copies under churning. This aqueous solution was maintained at 10DEGC, continuing churning, and 60 copies of hydrochloric acid was added to this 35%. Subsequently, 0.1 copy of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) was dissolved in 57 copies of butyraldehyde as compound (I) there, and per-continuum addition mixing of the whole quantity was carried out in 30 minutes. The grains of polyvinyl butyral generated 15 additive minutes after initiation. Temperature up was carried out to 40DEGC under churning of a reaction system after that, and it held by 40DEGC for 4 hours. The aqueous sodium hydroxide after termination of a reaction was added, this system was neutralized, and it cooled to the room temperature. Subsequently, washing, filtration, desiccation, etc. were performed and powdered white polyvinyl butyral composition was obtained. The

degree of butyral-izing of polyvinyl butyral in the obtained composition was 76%. Moreover, the content of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) in the obtained polyvinyl butyral composition was 0.065 copy to 100 copies of polyvinyl butyral. The viscosity stability and color stability which show the heat-resistant stability of the obtained composition are measured, and those results are shown in Tables 1 and 2.

[0028]

Execution example 2

0.05 copy of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) as compound (I) by the shape of anion nature basin system emulsified dispersion liquid the content of whose is about 50% Polyvinyl butyral composition was obtained like the execution example 1 except having added in the PVA aqueous solution of 10DEGC under churning in the reaction container, and having added continuously, having applied the butyraldehyde of 57 copies for 30 minutes. The test result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0029]

Execution example 3

Polyvinyl butyral composition was obtained like the execution example 1 except having made the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into 0.03 copy as compound (I). The test result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0030]

Execution example 4

Polyvinyl butyral composition was obtained like the execution example 1 except having made the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into 2.0 copies as compound (I). The test result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0031]

Execution example 5

Polyvinyl butyral composition was obtained like the execution example 1 except having changed the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into 0.015 copy as compound (I). The content of the above-mentioned compound (I) of the obtained composition and the test result of viscosity stability, are shown in Tables 1 and 2.

[0032]

Execution example 6

Polyvinyl butyral composition was obtained like the execution example 1 except having changed the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into four copies as compound (I). The test result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0033]

Execution example 7

It is made to be the same as that of the execution example 1 except having used 0.1 copy of 4,4'-butylidenebis- (6-t-butyl-3-methyl phenol) as compound (I) instead of 0.1 copy of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) of the execution example 1. Polyvinyl butyral composition was obtained. The test result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0034]

Execution example 8

100 copies of PVA(s) of average-degree-of-polymerization 2400 and saponification degree 98.5 mol% were added to it, churning the mixed solution of 490 copies of methanol in the reaction container which offered thermoregulation and a churning apparatus, and six copies of 35% hydrochloric acid. Subsequently, added 37 copies of acetaldehyde, and 34 copies of butyraldehyde to the suspension of this PVA grain under churning, it was made to react by temperature 60DEGC for 6 hours, and the methanol solution of the polyvinyl acetal which has an acetoacetal unit and a butyl acetal unit was obtained. It cooled after termination of a reaction, addition mixing of the aqueous sodium hydroxide was carried out, and reaction mixture was neutralized. Furthermore, addition mixing of 0.1 copy of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) was carried out as compound (I) at the reaction mixture. depositing [ add water in this liquid and ] grains and drying [ wash, filter and ] -- powder -- granular polyvinyl acetal composition was obtained. Polyvinyl acetal in the obtained composition 1.9% of a vinyl acetate unit, It was 16.4% of a vinyl alcohol unit, and was 81.7% (the rate of an acetoacetal unit and a butyl acetal unit is 50:50 at a bulk density by measurement by an infrared absorption spectrum) of a degree of acetalization. The result of the content of the above-mentioned compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0035]

Execution example 9

Instead of 100 copies of PVA(s) of average-degree-of-polymerization [ of the execution example 1 ] 1700, and saponification degree 98.5 mol% 50 copies of PVA(s) of average-degree-of-polymerization 2400 and saponification degree 99 mol% and 50 copies of PVA(s) of average-degree-of-polymerization 500 and saponification degree 98.5 mol% are used together. And polyvinyl butyral composition was obtained like the execution example 1 except having made the amount of the 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) used into 0.2 copy as compound (I). The content of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) of the degree of butyral-izing of polyvinyl butyral in the obtained composition was 0.13 copy to 100 copies of polyvinyl butyral 77%. The viscosity stability of the obtained composition and color stability are measured, and those results are shown in Tables 1 and 2.

[0036]

Comparison example 1

Polyvinyl butyral composition was obtained like the execution example 1 except having used 0.1 copy of 2,6-di-t-butyl -para cresol instead of 0.1 copy of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol). The test result of the content of 2,6-di-t-butyl -para cresol of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0037]



**Comparison example 2**

Polyvinyl butyral composition was obtained like the execution example 1 except having used 0.05 copy of 2,2'-methylene bis (4-methyl-6-t-butyl phenol) instead of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol). The test result of the content of 2,2'-methylene bis (4-methyl-6-t-butyl phenol) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0038]

**Comparison example 3**

Polyvinyl butyral was obtained like the execution example 1 except not having used 2,2'-ethylidenebis- (4,6-di-t-butyl phenol). The test result of the viscosity stability of the obtained polyvinyl butyral and color stability is shown in Tables 1 and 2.

[0039]

**Comparison example 4**

Polyvinyl butyral composition was obtained like the execution example 1 except having changed the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into 0.005 copy. The test result of the content of compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0040]

**Comparison example 5**

Polyvinyl butyral composition was obtained like the execution example 1 except having changed the amount of 2,2'-ethylidenebis- (4,6-di-t-butyl phenol) into 5.0 copies. The test result of the content of compound (I) of the obtained composition, viscosity stability, and color stability is shown in Tables 1 and 2.

[0041]

The execution examples 10-12 and the comparison example 6

2,2'-ethylidene-bis- (4,6-di-t-butyl phenol) is shown in Table 2 as 100 copies of polyvinyl butyral obtained by the comparison example 3 to 900 copies of ethanol / toluene (bulk density  $1/1$ ) mixed solvents, and compound (I) -- it added the amount of each every and the mixture solution was carried out. Reduced pressure drying of the obtained liquid was carried out by 20DEGC after the flow casting and the air dried on the polyester sheet, and film-like moldings about 300 microns thick were obtained. After putting this film into the container and carrying out predetermined days (for 2 and 4 or 6 days) heat in the oven of 120DEGC, it took out, and standing to cool was carried out and the yellowness of that surface color was measured by the procedure of (2) of 2 suits of measuring method color stability. It was considered as the color stability of moldings with the value of this yellowness. In addition, the yellowness on the 0th is an observed value of the film before heat. A test result is shown in Table 3.

[0042]

[Table 1]

	添 加 物 質		粘 度 安 定 性		
			溶液粘度 (cps)		
	名 称	含有量 <sup>1)</sup> (部)	0 日 (加熱前)	10 日	30 日
実施例 1	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.065	76.9	75.6	76.0
実施例 2	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.032	76.5	72.3	69.5
実施例 3	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.021	78.8	74.3	67.1
実施例 4	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	1.542	76.9	75.1	71.0
実施例 5	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.011	79.3	70.3	60.2
実施例 6	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	2.801	74.7	74.0	72.5
実施例 7	4,4'-ブチリデンビス-(6- <i>t</i> -ブチル-3-メチルフェノール)	0.061	75.8	74.2	70.8
実施例 8	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.037	170.8	171.5	169.8
実施例 9	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.130	67.2	65.4	63.9
比較例 1	2,6-ジ- <i>t</i> -ブチル- <i>p</i> -パラクレゾール	0.056	77.4	71.0	54.3
比較例 2	2,2'-メチレンビス-(4-メチル-6- <i>t</i> -ブチルフェノール)	0.032	75.9	68.3	57.8
比較例 3	—	(無添加)	75.3	52.4	18.4
比較例 4	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.004	77.9	62.7	48.0
比較例 5	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	3.340	74.2	71.5	71.2

<sup>1)</sup> 組成物中、ポリビニルアセタール100 部に対し添加物質を含有する量 (部)。

[0043]

[Table 2]

	添 加 物 質		着 色 安 定 性			
			黄 色 度			
	名 称	含有量 <sup>1)</sup> (部)	0 日	2 日	4 日	6 日
実施例 1	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.065	-1.6	3.5	5.1	6.3
実施例 2	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.032	-1.5	4.0	8.5	11.3
実施例 3	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.021	-1.0	5.2	9.5	18.0
実施例 4	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	1.542	-0.6	6.1	10.3	19.0
実施例 5	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.011	-0.1	8.0	17.3	30.2
実施例 6	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	2.801	-0.2	12.1	18.9	28.7
実施例 7	4,4'-ブチリデンビス-(6- <i>t</i> -ブチル-3-メチルフェノール)	0.061	-1.3	5.8	7.9	10.9
実施例 8	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.037	-0.5	5.0	8.4	12.1
実施例 9	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.130	-1.7	4.1	6.3	6.8
比較例 1	2,6-ジ- <i>t</i> -ブチル-パラクレゾール	0.056	-1.5	50.1	68.3	82.5
比較例 2	2,2'-メチレンビス-(4-メチル-6- <i>t</i> -ブチルフェノール)	0.032	-1.2	13.5	25.0	40.2
比較例 3	—	(無添加)	3.0	66.9	92.0	110.9
比較例 4	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	0.004	0.2	12.3	35.1	58.0
比較例 5	2,2'-エチリデンビス-(4,6-ジ- <i>t</i> -ブチルフェノール)	3.840	0.5	13.9	19.4	39.8

<sup>1)</sup> 組成物中、ポリビニルアセタール100 部に対し添加物質を含有する量 (部)。

[0044]

[Table 3]

	化合物 (I) の添加量 <sup>1)</sup> (部)	成形物の着色安定性			
		黄色度			
		0日	2日	4日	6日
比較例 6	0	4.1	68.3	95.7	115.9
実施例 10	0.02	3.1	9.3	19.8	24.0
実施例 11	0.1	2.9	6.5	9.6	12.4
実施例 12	2.0	3.3	8.5	13.2	20.5

<sup>1)</sup> ポリビニルアセタール100部に対する化合物 (I) の  
添加量 (部)。

[0045]

Measuring method

[0046]

## 1. Viscosity Stability

The polyvinyl acetal composition obtained by each execution example and each comparison example and polyvinyl butyral were made into the sample, and predetermined days (for 10 or 30 days) heat of it was carried out in the oven of 80DEGC. Subsequently, each sample after predetermined days heat was dissolved in the mixed solvent (ethanol/toluene = 1/1, bulk density), the solution was produced 5%, and the viscosity in 20DEGC of the solution was measured using B type rotational viscometer. In addition, 5% solution viscosity in 20DEGC of the sample before heat was made into zero day (before heat).

[0047]

## 2. Color Stability

(1) Make into a sample the polyvinyl acetal composition and the 100 mesh-sieve pass article of polyvinyl butyral which were obtained by each execution example and each comparison example, pay a sample to a container, and carry out predetermined days (for 2 and 4 or 6 days) heat in the oven of 120DEGC. A sample is taken out from the oven after predetermined days progress, and standing to cool is carried out.

(2) Subsequently, using the colorimetry color difference meter (Nippon Denshoku Z-1001DP type), the tristimulus values X, Y, and Z of the surface color of the sample were measured, and it asked for yellowness by the following formula. Color stability is shown with the value of this yellowness, the degree of a color is so low that this value is small, and it is shown that color stability is excellent.

yellowness =  $(100) (1.28X - 1.06Z) / Y$  -- in addition, yellowness zero day is a yellowness observed value of the powdered (100 mesh passes) sample before heat.

[0048]

3. Content of Additive Matter

Polyvinyl acetal composition obtained by each execution example and each comparison example is made into a sample. the liquid which dissolved it in the mixed solvent [ethanol/water =<sup>9</sup>/<sub>1</sub> (bulk density)] -- a high speed liquid chromatography (the Hitachi make --) Under [ a fixed quantity / comparison / which created the content of the additive matter beforehand using L-4000UVDETECTOR, 280nm of ultraviolet absorption, and L-6000PUMP / calibration curve ]. The value acquired with the fixed quantity was converted into the amount (part) to 100 copies of polyvinyl acetal in the above-mentioned composition, and was made into the content of the additive matter.

[0049]

[The effect of invention]

The polyvinyl acetal composition of this invention is excellent in heat-resistant stability, without spoiling the desirable characteristics of polyvinyl acetal as above-mentioned.